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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/040,017	01/04/2002	Mischa Megens	1-10-5	8821

7590 01/29/2004

Docket Administrator (Room 3J-219)
Lucent Technologies Inc.
101 Crawfords Corner Road
Holmdel, NJ 07733-3030

EXAMINER	
ANGEBRANNDT, MARTIN J	
ART UNIT	**PAPER NUMBER**
1756	

DATE MAILED: 01/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/040,017	MEGENS ET AL.
	Examiner	Art Unit
	Martin J Angebranndt	1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-18 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8/29,6/2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

1. The examiner would like to point out that it has been held in the courts that the "applicant has [an] obligation to call the most pertinent prior patent to [the] attention of [the] Patent Office in a proper fashion." [Penn Yan Boats, Inc. V. Sea Lark Boats, Inc., et al. 175 USPQ 260 (DC SFla 1972)]. The examiner would appreciate the applicant identifying why the cited reference is pertinent including relevant portions of the document cited.

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 10,13 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 13, "the photoresist" lacks antecedent basis.

In claims 15, "a medium" should read - - the medium - - as this has already been introduced in claim 14.

In claim 10, it is unclear how the changes can be both "periodic" and "non-constant"

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-10,14,16 and 18 are rejected under 35 U.S.C. 102(a) as being fully anticipated by Turberfield, "Photonic Crystals made by Holographic Lithography, MRS Bull. Pp. 632-636 (08/2001).

Turberfield, "Photonic Crystals made by Holographic Lithography, MRS Bull. Pp. 632-636 (08/2001) teaches the use of an Epoxy based resist EPON SU8, with a triarylsulfonium salt as the photoinitiator/photoacid generator. The resist is coated on a substrate, heated to remove the solvent, exposed to four beams. "absorption of the UV photon by the molecule of PAG liberates a hydrogen ion; acid catalyzed polymerization occurs when the film is heated in a post-exposure bake". The photonic crystal structure is revealed by development using propylene glycol methylether acetate in an ultrasonic bath. (page 633, right column). The formation of full connected polymer and air void lattices is disclosed. (page 634, center column). The filling of the resultant structure with titania is disclosed. (page 635, left column). The use fo three beam exposure is disclosed. (page 625, left column).

The statement that the polymerization does not occur until the post-exposure bake is held to meet the requirement that the exposure take place at a temperature at which refractive index changes do not occur. The examiner notes that room temperature is 25 degrees C and the specification describes temperatures below 65 degrees C as meeting this limitation in section [0044, prepub]. The viscosity post baking is held to meet the rubber-like phase limitation of claim 9.

7. Claims 1-10,14,16 and 18 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Campbell, et al., "Fabrication of Photonic Crystals for the Visible Spectrum by Holographic Lithography, Nature, Vol. 404. pp. 53-56 (03/2000).

Campbell, et al., "Fabrication of Photonic Crystals for the Visible Spectrum by Holographic Lithography, Nature, Vol. 404. pp. 53-56 (03/2000) teach the use of an Epoxy based resist EPON SU8, with a triarylsulfonium salt as the photoinitiator/photoacid generator. The resist is coated on a substrate, heated to remove the solvent, exposed to four beams. "absorption of the UV photon by the molecule of PAG liberates a hydrogen ion; acid catalyzed polymerization occurs when the film is heated in a post-exposure bake". The photonic crystal structure is revealed by development using propylene glycol methylether acetate in an ultrasonic bath. (page 54). The formation of full connected polymer and air void lattices is disclosed. The filling of the resultant structure with titania is disclosed. (page 54,right column).

The statement that the polymerization does not occur until the post-exposure bake is held to meet the requirement that the exposure take place at a temperature at which refractive index changes do not occur. The examiner notes that room temperature is 25 degrees C and the specification describes temperatures below 65 degrees C as meeting this limitation in section [0044, prepub]. The viscosity post baking is held to meet the rubber-like phase limitation of claim 9.

8. Claims 1-10,14 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over **either** Campbell, et al., "Fabrication of Photonic Crystals for the Visible Spectrum by Holographic Lithography, Nature, Vol. 404. pp. 53-56 (03/2000) **or** Turberfield, "Photonic

Crystals made by Holographic Lithography, MRS Bull. Pp. 632-636 (08/2001), in view of Liang et al. EP 408227.

Liang et al. EP 408227 teach the use of dye/onium salt complexes to extend the spectral response of photosensitive cationically curable compositions into the visible spectrum. (abstract, page 2/lines 25-39). Polymerizable materials include epoxies (page 5/line 4). The use of rose Bengal is disclosed. (pages 12-14). The use of triarylsulfonium salts as the onium portion of the complex is disclosed. (page14/line 29-32)

It would have been obvious to one skilled in the art to modify the compositions and processes of **either** Campbell, et al., "Fabrication of Photonic Crystals for the Visible Spectrum by Holographic Lithography, Nature, Vol. 404. pp. 53-56 (03/2000) **or** Turberfield, "Photonic Crystals made by Holographic Lithography, MRS Bull. Pp. 632-636 (08/2001) which use sulfonium salts by using dye/onium complexes to extend the spectral response of these compositions as disclosed by Liang et al. EP 408227.

9. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over **either** Campbell, et al., "Fabrication of Photonic Crystals for the Visible Spectrum by Holographic Lithography, Nature, Vol. 404. pp. 53-56 (03/2000) **or** Turberfield, "Photonic Crystals made by Holographic Lithography, MRS Bull. Pp. 632-636 (08/2001), in view of Liang et al. EP 408227 and Endo et al. '898.

Endo et al. '898 teach the addition of amines to epoxy resins to facilitate their dissolution or dispersion in solvents. Useful neutralizing agents include triethylamine. (57/50-58/3)

In addition to the basis provided above it would have been obvious to modify the invention of **either** Campbell, et al., "Fabrication of Photonic Crystals for the Visible Spectrum

by Holographic Lithography, Nature, Vol. 404. pp. 53-56 (03/2000) **or** Turberfield, "Photonic Crystals made by Holographic Lithography, MRS Bull. Pp. 632-636 (08/2001) combined with Liang et al. EP 408227 by adding an amine , such as triethyl amine to facilitate the dissolution/dispersion of the epoxy resin as taught by Endo et al. '898.

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1-18 are provisionally rejected under the judicially created doctrine of double patenting over claims 1,6 and 7of copending Application No. 10321027. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: The development of the resist is considered an obvious extension of the process of the claims of the instant application.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending

application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cowan et al. '571 teach the use of various lasers to form periodic holographic patterns. (2/56-61).

Kuznetsov '675 teaches cooling during exposure to prevent thermal polymerization. (7/34-39).

Xu et al. '898 teach cooling the resist after drying before exposure. (12/48-50).

Abele '004 teaches cooling the resist after drying before exposure. (5/57-59).

Imai '958 teaches cooling the resist after drying before exposure. [0043].

Rester '137 teaches cooling the resist after drying before exposure to preserve its photosensitivity. (8/52-58).

Ikutsu JP 2000-138156 teaches using supercritical carbon dioxide during drying of imaged resists to prevent swelling or collapse during the drying (abstract).

Ikutsu JP 2000-091180 teaches using supercritical carbon dioxide during drying of imaged resists to prevent swelling or collapse during the drying and allows the formation of fine patterns. (abstract)

Namutsu '507 teaches that the use of supercritical carbon dioxide during drying results in no pattern deformation.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9309 for regular communications and 703-872-9309 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Martin J Angebranndt
Primary Examiner
Art Unit 1756

January 22, 2004